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INTERNATIONAL BULLETIN
OF
PLANT PROTECTION

DISCOVERIES AND CURRENT EVENTS
IN WORLD PHYTOPATHOLOGY *

Belgian Congo: Some Diseases of Cultivated Plants (1).

Thielaviopsis sp. has caused the death of a large number of oil palms (*Elaeis*) at Flandria (Huilleries of Belgian Congo).

Colletotrichum sp. is attacking the leaves of *Elaeis* at Flandria.

Aecidium Torae is destroying all the *Cassia Tora* crop at Eala.

Sclerotinia sp. is attacking *Manihot utilissima* at Lac Léopold II and is causing great damage to it.

'Iraq: *Eurygaster integriceps* and Rodents (2).

Ergaija ("Sunn"), *Eurygaster integriceps*. — As was the case in 1926 this insect was reported as doing damage in one district only, viz: Sulaimania near the Persian frontier in the mountains. Here considerable damage was done to tobacco and cereal crops. The reasons for its erratic occurrence from year to year are still matters for conjecture.

Rodents. — In various localities several species of rodents, in part still unidentified, have attained pest dimensions causing damage to young winter cereals (Zakho and Rowanduz districts in the months of December and January 1926-1927, specimens having been provisionally identified as *Microtus guentheri* by the British Museum) and to maize and millet in ear during July, August and September as well as to cotton crops, the bolls being attacked and the seed eaten. Such damage has been report-

* In this, as in the two following chapters, the countries are arranged in the French alphabetical order.

(1) Communication from the official correspondent to the Institute, Dr. Pierre STANER, Director of the Mycological Laboratory, Eala.

(2) Communication from Mr. F. H. JACKSON, for the Inspector-General of Agriculture, Baghdad, official correspondent to the Institute.

ed on about 50 miles of the Tigris cultivation belt South of Baghdad and on some of the Euphrates canals.

The Department of Agriculture has distributed large quantities of sodium arsenite with which baits of soaked or boiled wheat, barley or rice were poisoned and afterwards made more appetising with mutton fat or ghee. These baits scattered near the rodents' burrows have given effective control in a number of cases.

Dominican Republic : A Disease of the Mulberry New to the Country (1).

The leaves of mulberries (*Morus* spp.) growing in young plantations near the National Agronomic Station at Moca have been somewhat seriously attacked by bacterial disease.

The trouble is probably due to *Pseudomonas Mori* (B. and L.) Stev. Hitherto the disease had not been identified in the Dominican Republic.

Provision is being made for the partial defoliation of the trees and the burning of the infected leaves.

Kingdom of the Serbs, Croats, and Slovenes : A destructive Disease of the Poppy in Southern Serbia (2).

The cultivation of the poppy (*Papaver somniferum*) which is one of the most important and remunerative in Southern Serbia was severely tied by mildew (*Peronospora arborescens* [Berk.] De Bary) in the spring of 1927. This parasitic fungus, which is not new to the district, spread in 1927 with great intensity causing enormous damage. Nearly all the poppy fields were seriously attacked, and the opium crop was reduced by $\frac{1}{2}$ and even in certain places by $\frac{2}{3}$. (Bašino Selo, Gradsko). I saw several fields where all the plants were completely dry before the incision operation. There the loss was total.

Mildew made its appearance at the beginning of May in the neighbourhood of Kavadar, Gradsko, Veles and Štip and a little later round Skoplje where the climate is slightly colder. At first 2-3 lower leaves were attacked; then the parasite gradually took possession of the other leaves, the disease abating somewhat towards the top of the plant. At the beginning of June the lower leaves which were first attacked were already completely dry; those in the middle were severely affected showing numerous brown patches which occupied most of the leaf surface. The higher leaves were more or less spotted, but the top leaves, on the contrary, were often

(1) Communication from the official correspondent to the Institute, Dr. R. CIPERRI, Phytopathologist and Director of the "Estación Nacional Agronómica y Colegio de Agricultura" at Moca.

(2) Communication from the official correspondent to the Institute, Dr. Mladen YOSSIFOVITCH, Maître de Conférences of Plant Pathology at the University of Belgrade.

quite healthy. This progress of the disease from below to above, which is very characteristic, was found in all the poppy fields visited by me.

Leaves attacked at the beginning of the invasion were very quickly overspread by the parasite and had their lower surface entirely covered by the downy coating formed by the conidiophores and conidia of *P. arborescens*. On the higher leaves this characteristic coating, especially on the dry places, was not always found, though in those which were moist it was rarely absent. The influence of atmospheric humidity on the production of the conidia was well shown.

The parasitic fungus also attacked the stalk and even the capsules, and produced on them dark brown patches sometimes covered with conidia. Often these spots completely surrounded the base of the stem, in which case the premature death of the whole plant followed.

An interesting point to note is that the poppy mildew continued to spread during the month of May despite the very dry weather. This proves that *P. arborescens* does not essentially need humidity nor is rain indispensable for its development and spread.

Attacks of the poppy disease were rife in the same district in 1926 also, but were not so severe. In 1927 it became a real scourge and there is reason for fearing that it will become even more serious this year, since the organization of control measures is fraught with great difficulties.

Kingdom of the Serbs, Croats, and Slovenes: Two Insects Harmful respectively to Insect-Powder Plant and Citrus in Dalmatia (1).

Phytoecia virgula Charp. (Col. *Cerambycidae*). — Hitherto this beetle, which was rather uncommon, had been found in Dalmatia on different plants such as: *Tanacetum vulgare* and *Daucus Carota*.

Already in 1926 M. MLADINOV, the agricultural inspector of Dubrovnik (Ragusa), had noted it as harmful to insect-powder plant (*Chrysanthemum cinerariaefolium*). I myself noted it on 17 May, 1927 at Gruda, Čibača and Lopud (South Dalmatia) in considerable numbers on insect-powder plant. The insect flies during the hot hours of the day from one plant to another, alighting nearly always on the stems and leaves and only rarely on the flowers. Several cases of pairing were seen.

An examination of different plants of *Chrys. cinerariaefolium* which appeared to be sickly, showed in the lower part of the stems close to the ground, where the stem is at its largest, galleries produced by the larvae of *Phytoecia*. In certain cases the adults were found in the galleries.

I have not yet been able to determine exactly the distribution of the beetle, but since it occurs throughout the district of Dubrovnik and is widespread throughout Dalmatia, it very probably exists wherever the insect-powder plant is grown.

(1) Communication from the official correspondent to the Institute, M. P. NOVAK, Director of the Entomological Station at Split.

Tapinosoma erraticum s. *nigerrimum* Nym. — I had already noticed in 1926 at Lopud (Isle of Mezzo) near Dubrovnik (Ragusa) this Ant in the act of invading citrus trees and gnawing the young shoots at the base, causing them to wither and then dry up.

In 1927 towards the end of April and the first days of May I observed it at Split doing similar damage to the citrus plants. I must add that, as at Split, so at Lopud the plants were invaded by Aphids which ordinarily are accompanied by Ants. Hence the Ant in question must be considered as directly harmful.

I noticed it also on roses as well as on citrus plants and on the flower buds of caper plants, gnawing the petals and so spoiling the young flowers. On a single rose bud I found as many as 40 specimens of this insect.

VARIOUS QUESTIONS RELATING TO PLANT PROTECTION IN THE DIFFERENT COUNTRIES

'Iraq: Locust Control (1).

Following on the excellent results from the campaign against *Dociosaurus maroccanus* in March, April and May, 1927 when cereal crops were saved in great measure from the attacks of hopping swarms, 'Iraq was invaded on a very large scale by flying locusts from Persia, Syria and Turkey. In addition large migrations took place from the 'Iraq Jezireh (steppe and desert country), West of the Tigris and North of the Euphrates, into the cultivated regions East and South. These flying swarms did great damage to young summer crops but only to relatively small areas of late-maturing wheat; they then laid eggs extensively, not only in the plains and foothills of the Northern Liwas as usual, but (for the second year in succession) in the Euphrates and Tigris regions as far South as the latitude of Baghdad.

A determined campaign against this, the most serious pest of 'Iraq, is again in active preparation for 1928, staffs have been augmented and are engaged in discovering and recording breeding areas, while funds to the extent of Rs. 1,600,000 have been allotted by the Government for the purchase of poisoned bait materials (sodium arsenite, molasses and bran) and for the general conduct of the 1928 campaign.

(1) Communication from Mr. F. H. JACKSON, for the Inspector-General of Agriculture, Baghdad, official correspondent to the Institute.

In addition to the use of poisoned bait, on which the 1927 campaign was based, the following methods were also employed in localities specially suitable :—

Digging and collection of eggs.

Ploughing of breeding grounds.

Burning desert vegetation over swarms.

Driving the hoppers into trenches.

Not one of these has been found to compare with poison bait for economy in money and labour, and under 'Iraq conditions they are likely to remain subsidiary or, as in the case of egg collecting, to be abandoned.

In certain infested localities an interesting natural control of locusts has been found. Jerboas or Gerbils (species not yet identified) by digging out and eating locust eggs have efficiently dealt with appreciable areas of breeding grounds. Steps are being taken to protect these rodents from nomadic Arabs who regard them as a delicacy.

Syria : Locust Control in 1926-27 (I).

Towards the end of March and the first days of April 1926 locusts came from the boundaries of 'Iraq on to the frontiers of the Liwa of Deir-El-Zohr.

Egg laying areas for 1926-27 were as follows :

Caza of Deir El-Zohr	53,943	dounoums (= 1000 m ²)
» » El Maïadine	16,823	» or . 247 acres)
» » Abou-Kemal	11,385	»
» » El Hassetché	228,700	»
» » Kerou	71,280	»
» » El-Rika	81,105	»
Total	463,236	»

The above are distributed in 302 villages of these Cazas.

Destruction of eggs. — The work started on 1 January, 1927. The ground where the locusts had laid their eggs was ploughed three times in succession, allowing 10 days interval between each ploughing. This operation was continued up to the end of February. Certain difficulties were encountered in the work by reason of the stony ground and desert places, where labour and in fact population of any sort is entirely lacking.

Destruction of young insects. — Hatching took place towards the end of March 1927 and continued, varying with the temperature up till 8 April, the area where hatching had taken place being estimated at 378,400 dounoums.

Control methods against the young insects were as follows :

(1) The ditch method. This method was followed at the Cazas of Deir El-Zohr, El-Maïadine, Abou-Kemal, El Rika, El Hassetché, the ditches being from 3-5 m. long by 50-70 cm. broad. About 101,663 ditches were made in Liwa and 4,073,120 kgs. of insects were there destroyed.

The water of the Euphrates was used for submerging the egg laying areas, the length of the ditches for summering being estimated at 61,250 m. . 1,401,800 kgs. of insects were destroyed by this method.

(2) By my zinc sheet method 2,286,730 kgs. of insects were destroyed.

Table giving the egg laying areas of locusts during the years 1926 and 1927 together with the labour and the Feddans available for each Caza.

Name of the Caza	Egg Laying area 1927 dounouns	Egg Laying area 1926 dounouns	Labour		Feddan	Date of observation of egg laying	
			men	women		from	to
El-Bab . . .	4,978	7,050	772	772	531	17 August . .	27 September
Moubidj . . .	23,741	27,413	1,582	1,582	1,582	14 July . . .	22 July
Djebel-Samâân	4,930	—	392	435	116	9 June . .	19 September
Djerablousse .	58,130	30,785	3,213	3,233	1,807	20 June . . .	28 August
El-Rika . . .	7,065	81,125	5,215	6,406	2,211	25 June . . .	8 August
Nacibine. . .	32,630	98,280	1,750	2,000	594	1 June . . .	9 August
El-Hassetché .	21,650	228,700	470	580	117	14 August . .	30 August
Deir-El-Zohr .	10,507	53,943	9,273	7,556	1,815	25 June . . .	26 September
Abou-Kemal .	10	11,385	1,750	2,115	546	2 September	11 September
El-Maïadine .	1,950	16,823	930	2,210	474	10 August . .	19 August
	165,591	555,505	25,347	26,889	9,813		

Observations :

- (1) A Feddan is a yoke of oxen for ploughing purposes.
- (2) A dounoun is approximately 1000 m² or . 247 acres.
- (3) Under labour is given the number of men and women in each Caza available for locust control work.

(3) By poison baits 9980 kgs. of insects were destroyed.

Several attempts were made to destroy the young insects of 1 to 20 days old by a 5 % solution of pyrethrum-soap, by Arsenison spread on the hatching places and by Cyanogas Dust A and B powdered on the young insects.

These operations gave very encouraging results.

Preliminary discussions are in progress for the organization of an International Information Bureau on locusts. The adhesion of the Turkish Republic has been obtained and also that of Iraq. Its final establishment is now dependent on the countries who took part in the Conference.

LEGISLATIVE AND ADMINISTRATIVE MEASURES

Germany. — A common health certificate is advised for the sake of uniformity for all imports of every kind of plant and plant parts into States which are not signatories of the International Phylloxera Convention and which, apart from prescribing a common health certificate, have not issued any special regulations with regard to plant health certificates. It takes the form of a certificate sheet on which the number of articles, the owner's distinctive mark, number of truck, methods of distinguishing parcel and address of both consignor and consignee must be given and a declaration by the official expert that the plants or plant parts forming the parcel have been duly examined and found free from dangerous and communicable plant diseases and pests. Room is left on the sheet for "Special Observations" where by request the freedom of the parcel from sundry pests (e. g. woolly aphids [*Eriosoma lanigerum*]) or the freedom from infection of the packing material (e. g. new sacks) or of the place of origin may be certified. The specimen certificate is printed as "Formblatt Nr. 21" and can be obtained for 10 pfennigs from the "Biologische Reichsanstalt für Land- und Forstwirtschaft" at Berlin-Dahlem. (*Nachrichtenblatt für den Deutschen Pflanzenschutzdienst*, Berlin, 1927, 7. Jahrg., Nr. 12, S. 123).

Germany (Lippe). — Police Order No. 65 of 31 August, 1927 contains detailed regulations for the control of wart disease (*Synchytrium endo-*

bioticum), regarding the inspection of potato fields and stores, the determination of the disease, the restrictions on the use of infected fields and of fields under suspicion of infection, and of the measures to be taken with regard to stocks of diseased potatoes outside agricultural control. The Order came into force on the day of issue. (*Lippische Gesetz-Sammlung*, Detmold, 9. September 1927, Nr. 34, S. 249-252).

Spain. — Royal Order No. 579 of 15 October, 1927 enacts that the Royal Customs shall accept phytopathological certificates required for the exportation of plants and fruits, always provided that the difference between the weight stated on the consignment and the actual weight of the goods does not exceed the limits laid down for certificates of origin in paragraph (b) of rule 4^a of the Customs Tariff Regulation No. 10. (*Gaceta de Madrid*, Madrid, 30 octubre 1927, año CCLXIV, tomo IV, núm. 303, págs. 637 y 638).

Italy. — Royal Decree, No. 2172, of 17 November, 1927, approves the Regulation for giving effect to Law No. 1272 (see No. 8 [1927] of this Bulletin) and of Royal Decree-Law No. 1756 of 12 August, 1927, concerning the institution of a national exportation mark for fruit, fresh and dried, citrus fruits and vegetables intended for export. (*Gazzetta ufficiale del Regno d'Italia*, Roma, 5 dicembre 1927, anno 68^o, n. 281, pp. 4658-4663).

Morocco. — The "dahir" of 30 September, 1920, compels traders and growers exporting into the French zone of Morocco living plants or parts of plants for propagation purposes to furnish for each consignment or parcel of plants, for the sending of which they are responsible, a certificate of phytopathological inspection issued by the Official Service of the country of origin. This document must attest that the plants for which it is drawn up come from an establishment regularly inspected and recognized as free from diseases and pests. It must, in addition, indicate the exact place of origin of the plants imported and also all references required for the identification of the parcels.

Consignments not accompanied by the phytopathological certificate will on their arrival in Morocco be rejected or destroyed at the expense of the consignee.

The importation of plants is only authorized through the proper commercial ports or through the frontier post of Oudjda.

The provisions of the "dahir" of 30 September, 1920 are extended to include table potatoes by the "dahir" of 4 November, 1922.

The above regulations apply to plants coming from Algeria; however, in order to adapt the legal prescriptions to the needs of Algerian-Moroccan trade in food plants, potatoes coming from the neighbouring Colony are subject to the following provisions:

"(1) Table potatoes coming from foreign countries and entering Morocco by the Algerian-Moroccan frontier will be imported under cover of the phytopathological certificate demanded by the Algerian Govern-

ment. Lots coming from France will be accompanied by a certificate of origin. In both cases these documents will have the visa of the Plant Protection agent whose duty it is to inspect plants on their entry into Algeria.

"The phytopathological certificate or the certificate of origin, according to circumstances, will be issued and sent to the Service of the Sherifian custom houses by the above mentioned Algerian official, who will have previously ascertained that the various parcels contain all necessary indications, especially those allowing the identification of the goods such as the name and address of the consignee, the mark of the parcels and the weight of the consignment. The Algerian importers may then forward into Morocco in one or several consignments, within the limits of the quantities shown on the certificate, the lots of potatoes for which certificates shall have been sent to the Sherifian custom houses.

"(2) Potatoes harvested in Algeria will enter Moroccan territory accompanied by a compulsory phytopathological certificate drawn up by the Plant Protection Inspection Authorities at Algiers".

As regards other questions, to avoid the introduction into the crops of Eastern Morocco of *Icerya purchasi*, which is now acclimatized on Algerian territory, an agreement has been arranged between the Governments of Algeria and of the Protectorate in accordance with the terms of which citrus fruits coming from Algeria must be accompanied by a phytopathological certificate. (*Ministère de l'Agriculture, Direction de l'Agriculture, Bulletin de l'Office de Renseignements Agricoles*, Paris, 1927, année 1927, n° 17-18, p. 259).

Mexico. — The Regulation for agricultural sanitary control issued on 5 July, 1927 is specially concerned with the organization of the "Servicio de Defensa Agrícola" attached to the "Secretaría de Agricultura y Fomento", the actual work being performed by the "Oficina Federal para la Defensa Agrícola" and the organizations under its control. A "Consejo Superior de Defensa Agrícola" is established with consultative functions. The "Secretaría" has the power to authorize the constitution of "Comisiones Nacionales y Regionales para la Defensa Agrícola", which will assist the "Secretaría" and the "Oficina" in their enquiries relating to plant diseases and pests and suitable means of control, in the adoption of these control measures when approved by the "Secretaría", in the supervision of the execution of legislative and administrative provisions, etc.

Whenever as a result of the work and enquiries carried out by the "Oficina", or in any other way, the presence of a pest or disease is determined, or when there are good reasons for suspecting its appearance in any given district, the "Secretaría" will declare this region subject to quarantine and will establish therein a control zone. Quarantine may be either total or partial. A list will be made of the plants or products subject to the quarantine as possible carriers of the pests or diseases. Under total quarantine the introduction or transportation within the district or the exportation from the district of the materials specified by the

"Secretaría" is prohibited. Under partial quarantine the introduction, exportation and transport of these products is subjected to the observance of certain special restrictions.

The "Oficina" will carry out periodical inspections of the establishments which deal in live plants or live parts of plants or their products. These establishments must keep a register showing the source of origin, the date of receipt and the date on which all the products that they place on the market have been inspected.

The importation of plants, parts of plants or their products which are not subject to foreign quarantine can only take place at the ports and towns on the frontier indicated by the "Secretaría".

Plants, parts of plants or their products of foreign origin attacked by plant pests or diseases dangerous to agriculture will be placed under foreign quarantine. This may be either total or partial according as the importation is entirely prohibited or where, disinfection or fumigation being sufficient, entry is allowed under certain special conditions.

The "Secretaría" through the "Oficina" will issue certificates of health for plant products intended for exportation whenever free from all diseases or pests dangerous to agriculture. These certificates will be issued when the products covered are intended for countries with which an exchange of agricultural products is customary, or with which diplomatic agreements have been made for the reciprocal acceptance of health certificates, or when the products are intended for countries where the law requires special certificates.

The Regulation also contains provisions of a general character and specifies the penalties which may be applied for infringement of its terms. (*Diario oficial*, México, 16 de julio de 1927, tomo XLIII, núm. 14, págs. 3-9).

* * In order to prevent the spread in the Republic of *Pseudomonas Citri*, Hasse ("cáncer cítrico"), *Tylenchulus semipenetrans*, Cobb ("lombriz de las raíces de los árboles del género Citrus"), *Aleurochantus woglumi*, Ashby ("mosca negra del naranjo") and other diseases and parasites hitherto unknown or not widespread in Mexico, which attack Citrus trees or their parts, and in accordance with the "cuarentena exterior número 1", dated 17 July, 1927, the following rulings have been made:

For the importation into the Republic of Citrus trees or their parts importers must obtain a special permit from the "Oficina para la Defensa Agrícola", specifying in their request for this permit the name and address of the exporter, the locality, the district and country where the plants have been grown, the port of loading and the port from which the Consular Invoice has been issued, the port through which the goods are to be imported, the number of plants or their parts to be imported, the name and address

of the consignee. The duration of validity will be stamped on every permit.

The goods will be accompanied by a certificate in due legal form issued by the plant inspection authorities of the country of origin and containing the following information: the number of the permit issued by the "Oficina", date of inspection, the name and the address of the importer, the locality, the district or country of origin, the name and address of the consignee, a declaration that the plants or their parts come from districts free from *Ps. Citri*, *Tyl. semipenetrans*, *Al. woglumi* and from other dangerous pests.

Unloading and introduction into the country will only be allowed in the following ports and frontier custom-houses:

(a) on the Northern frontier of Mexico: Mexicali, B. C.; Nogales, Son.; Ciudad Juárez, Chih.; Piedras Negras, Coah.; Nuevo Laredo, Tamps.; Matamoros, Tamps.; (b) in the Gulf: Tampico, Tamps.; Veracruz, Ver.; Puerto México, Ver.; Frontera, Tab.; Progreso, Yuc.; (c) on the Pacific: Guaymas, Son., Yavaros, Son.; Topolobampo, Sin.; Mazatlán, Sin.; Manzanillo, Col.; Acapulco, Gro.; Salina Cruz, Oax.; (d) on the Southern frontier: Tapachula, Chis.

On receipt of special request the "Secretaría de Agricultura y Fomento" may issue a permit for the loading or the introduction of the Citrus plants or their parts in ports or custom-houses other than those indicated above, the expenses in connection with the visit to the spot of an inspector, whose duty is to examine the health conditions of the imported products, being charged to the importers.

The cargo will be examined in the port of entry by an inspector of the "Oficina", who will prohibit its introduction in case of infection unless the "Secretaría" considers that disinfection and fumigation will suffice to prevent the spread of the diseases or the pests concerned, in which case the goods will be disinfected or fumigated.

The cost of fumigation or disinfection and of any other work incident to the inspection will be charged to the consignee of the goods.

Permits already issued will be annulled when not in agreement with the various rulings of the present "cuarentena".

Infringements will be punished by fines of 10.00-500.00 "pesos" or by imprisonment not exceeding 10 days.

The present "cuarentena" does not concern Citrus fruits. (*Diario oficial*, México, 27 de agosto de 1927, tomo XLIII, núm. 10, págs. 10-11).

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[List of 50 Micromycetes hitherto unrecorded in the Province of Siena, 11 being new to Italy and 3 to Europe. *Septoria Escalloniae*, parasitic on the leaves of *Escallonia rubicunda* is described as a species new to science.]

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[In Dutch, with English abstract. The disease of the sugar cane (var. Poj, nos. 2878 and 2722) called "Pokkahboeng" in Java and the tip rot are produced by *Fusarium* sp.]

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[Chapter IX is edited by Prof. V. BONGINI, Chap. X, by Prof. C. SIBILIA, and Chap. XI, by Prof. P. VOGLINO.]

The parasites dealt with are: *Oidium monilioides*, *Erysiphe graminis*, *Cladosporium herbarum*, *Cl. graminum*, *Alternaria tenuis*, *Acremonia oculata*, *Acr. verrucosa*, *Septoria graminum*, *S. Tritici*, *S. nodorum*, *S. glumarum*, *Leptosphaeria Tritici*.

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NOTES

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